

# PATENT COOPERATION TREATY

# PCT



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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>PPD 70229/WO</b>	<b>FOR FURTHER ACTION</b> <div style="text-align: right;">See Form PCT/PEA/416</div>																									
International application No. <b>PCT/GB2004/000726</b>	International filing date (day/month/year) <b>23.02.2004</b>	Priority date (day/month/year) <b>24.02.2003</b>																								
International Patent Classification (IPC) or national classification and IPC <b>C07C253/30, C07C255/39</b>																										
Applicant <b>SYNGENTA LIMITED</b>																										
<ol style="list-style-type: none"> <li>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</li> <li>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</li> <li>3. This report is also accompanied by ANNEXES, comprising:               <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:                   <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ol> </li> </ol>																										
<ol style="list-style-type: none"> <li>4. This report contains indications relating to the following items:               <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 10%;">Box No. I</td> <td>Basis of the opinion</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> </li> </ol>			<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand  <b>22.09.2004</b>	Date of completion of this report  <b>01.03.2005</b>																									
Name and mailing address of the International preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  <b>Fitz, W</b>  Telephone No. +31 70 340-4359  																									

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/000726

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-8 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/000726

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-8
	No: Claims	-
Inventive step (IS)	Yes: Claims	-
	No: Claims	1-8
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	-

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**Re Item V.**

The following documents are referred to in this communication:

D1 : EP 0 304 954 A (ICI AUSTRALIA LTD) 1 March 1989 (1989-03-01)

D2 : WO 02/06202 A (SYNGENTA LTD ;BROWN STEPHEN MARTIN (GB);  
GOTT BRIAN DAVID (GB)) 24 January 2002 (2002-01-24)

D3 : EP 0 109 681 A (SHELL OIL CO) 30 May 1984 (1984-05-30)

**1 Novelty:**

The subject-matter of claims 1-8 is considered as new in the sense of Article 33(2) PCT, because the available prior art documents do not disclose a process as defined in these claims.

**2 Inventive step:**

**2.1 INDEPENDENT CLAIM 1**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not inventive in the sense of Article 33(3) PCT over either of documents D1-D3.

Document D1 discloses (cp. example 19) a process for the preparation of gamma-cyhalothrin (IV) wherein 1R cis-Z 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylic acid (I) is condensed with the (S)-cyanohydrin of 3-phenoxy benzaldehyde (III) in the presence of dicyclohexylcarbodiimide. The difference between the subject-matter of claim 1 of the application and example 19 of D1 is that in claim 1 acid (I) is converted into the corresponding acid chloride (II) which is then reacted with alcohol (III) to give the desired gamma-cyhalothrin (IV), whereas in example 19 of D1 acid (I) is directly treated with alcohol (III) to give (IV).

The problem underlying the application is considered as the provision of a further process for the preparation of gamma-cyhalothrin.

The problem is solved by converting (I) into the corresponding acid chloride (II) which is then reacted with (III) to give gamma-cyhalothrin (IV).

D1 also teaches (cp. p.21, l.22-30) that the pyrethroids can be prepared not only by condensation of the acid with the (S)-cyanohydrin of 3-phenoxy benzaldehyde (III), but also discloses the option of performing the esterification by treatment of the (S)-cyanohydrin of 3-phenoxy benzaldehyde (III) with the acid halide.

Thus, in view of the teachings of D1, the subject-matter of claim 1 is considered as obvious. Consequently, the subject-matter of claim 1 does not involve an inventive step over D1.

Document D2 discloses (cp. p.3, scheme; claims 5 and 6; example 12) a process for preparing enantiopure pyrethroid esters by converting a single enantiomer of an acid into the corresponding acid chloride which is then reacted with the cyanohydrin of 3-phenoxy benzaldehyde to give the desired product.

The general formula of the acid and the acid chloride of D2 encompass the acid and the acid chloride of claim 1 of the application.

Thus, in view of the teachings of D2 the subject-matter of claim 1 is considered as obvious. Consequently, the subject-matter of claim 1 does not involve an inventive step over D2.

Document D3 discloses (cp. claims 7 and 10) a process for preparing pyrethroid esters by treating a chiral cyclopropane carboxylic acid chloride with the (S)-cyanohydrin of 3-phenoxy benzaldehyde (III).

2,2-Dimethyl-3-(2-(trifluoromethyl)-2-chlorovinyl)cyclopropanecarbonyl chloride is disclosed (cp. p.21, l.19-20) as a preferred starting material.

Thus, in view of the teachings of D3 the subject-matter of claim 1 is considered as obvious. Consequently, the subject-matter of claim 1 does not involve an inventive step over D3.

## 2.2 DEPENDENT CLAIMS 2-8

Dependent claims 2-8 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).